BLACK BOX

Broadcast and Media Solutions

Enabling next-generation connectivity solutions for broadcast and media professionals.

HD Video and Peripheral Matrix Switches

IP-Based Video and Peripheral Extension Over a LAN

Quad-Screen Viewing

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Empowering clients with technology, support, and expertise.

Black Box helps clients in the media and broadcasting industry design, build, deploy, and upgrade mission-critical monitoring and control solutions, video processing and distribution infrastructure, and high-performance networking systems to improve collaboration and productivity, lower operating costs, and simplify back-end support systems to deliver clear competitive advantages.

Let us help you leverage more than 37 years of expertise, reliable technologies, and proven performance to achieve unprecedented collaboration with transparent access to the tools and systems needed to deliver world-class results.

The research and design of fast, flexible, and reliable tools assist our clients in supporting instantaneous switching, HD video signal transmission, and SDI, HD-SDI, and 3G SDI signal distribution. Create a competitive advantage through ergonomic, efficient workflows by planning, integrating, and deploying switching and extension solutions. The key to success is to deploy proven technology solutions in proven ways. We are committed to helping our customers succeed as you transition to the digital media environment.

- Collaboration is supported between broadcast personnel and studio teams without a major redeployment of equipment or infrastructure redesign, saving time and money.
- Editors, directors, post-production, and broadcast engineers have full access to all equipment allocated to them via KVM peripheral matrix switching.
- Desktop peripherals function with no latency, and desktop users have access to dual-screen and dual-link capable equipment.
- Extend and distribute completely lossless, pristine video quality regardless of format: DVI, SDI and HD SDI, 3G, and more.

About Black Box

Black Box is a provider of high-end, broadcast-ready products to help clients in the media and broadcasting industries design, build, deploy, and upgrade mission-critical monitoring and control solutions. The company has been a leading technology partner since 1976. Black Box is a public company (NASDAQ:BBOX) with nearly $1 billion in revenue annually. The Black Box Quality Management System is ISO 9001:2008 Certified. Black Box services more than 175,000 clients in approximately 150 countries with approximately 200 offices throughout the world.

Pre-sales Engineering
and 24/7 Tech Support
724-746-5500

What Black Box Offers

- KVM and hybrid KVM peripheral switching platforms
- HD video extension, including DVI, SDI, HD SDI, 3G
- Signal conversion and signal distribution
- Quad-screen viewing, instantaneous switching, multiple monitor viewing
- Video delivery via IP multicast
- Whisper racks and seismic cabinets

Where Black Box Fits

- Master control rooms
- Post-production suites and service bureaus
- Encoder and transcoder farms
- Trucks and mobile broadcasting vans
- Equipment rooms
- Display and signage

What You Get with Black Box

- Transparent, effective collaboration for media professionals.
- Control and monitoring of mission-critical workflow.
- Flexible control of visual tools and peripheral elements
- Real-time instant switching and display of HD video and peripherals.

Technology in action: Connectivity and switching solutions.

Project: Upgrade servers and KVM systems to DVI and USB extension and switching, and make them work with existing infrastructure.

The challenge

A public television station in Southern Germany was planning the construction of its broadcasting center. The station wanted to expand existing capacity by replacing old hardware. Servers and KVM systems were to be upgraded to DVI video and USB interfaces for extension and switching.

The servers are located in a central equipment room. Several directing and editing rooms are connected to the servers via CATx and fiber cables. The workstations within the directing suites are equipped with one or two monitors. Some jobs also require a USB 2.0 connection for special input devices. The system needs to be controlled in real time and down to the BIOS level from the central equipment room via the KVM matrix switch. Additionally, the KVM system needs to work with an external matrix controller, which also handles automatically switching the broadcast signals.

The solution

The broadcast station required switching and extension flexibility, the ability for multiple users to collaborate in real time, instantaneous switching of HD video, and a workflow that would not be interrupted. The broadcast company chose the Black Box DKM FX platform to implement the requirements, with the 288-port matrix switch controlling the signals required by the application. Within the 288 ports, the matrix switch features freely scalable inputs and outputs, plus the ability to mix copper and fiber cabling.

Using DKM FX extenders, users' consoles, including multiple monitors and USB peripherals, are smoothly integrated into the KVM peripheral matrix switch system, which requires little space. The connections of the consoles and servers are, depending on the distance requirement by the building structure, transmitted via CATx or fiber, which has no effect on the signal quality, maintaining the same high level of resolution whatever distances or media are used. The final application includes 150 to 160 servers and 120 to 130 user consoles being freely connected and switched over the DKM FX platform.

The compilation of the servers for the individual directing rooms is nearly the same. This simplifies disaster recovery in an emergency. With assistance of the DKM FX and an external controller, all servers can be switched altogether to another directing room, where users can then take over active control with no hesitation. Even directors don't experience any problems, as their front-end remains unchanged. Thus the automated studio operation is ensured with the greatest individual flexibility.

Project: Transmit lossless HD video from a mobile van (Outside Broadcasting Van, or OBV) directly to televisions.

The challenge

Black Box France was contacted by French television stations located in Strasbourg and Toulouse to find a solution to add digital signal extension from their new broadcasting trucks. The solution had to enable the connection of different devices (CPU, servers, monitors, etc.) with different resolutions and different video signals (analog and digital). Additionally, analog audio and the USB interface had to be extended as well.

The truck contains between 60 and 80 devices for users to access, all within a close distance to each other. Video extension needed to have a resolution of 1920 x 1200, with the quality of a direct connection and instantaneous switching. The vans are the interface between a live television show and the television—the equivalent of mini-studios on the road. The solution needed to include the option of extending KVM up to 500 meters from the truck.

The solution

After several demonstrations of the Black Box DKM FX extension and switching platform, the customer realized that this was the answer he needed. The DKM FX system addressed each of the challenges. It was a single, modular answer to a multi-layered application. An additional selling point is that, as a leading technology and system integrator, Black Box provides pre- and post-sales engineering consultation, and supplies free, ongoing tech support.

Black Box engineers assisted the client throughout the design phase of the broadcast trucks, which enabled optimum integration of the DKM FX solution. Several trainings were also held during the integration with all personnel likely to use the DKM FX switching matrix.

Today in France, two unique media vans travel the roads, broadcasting news and television shows directly into homes without trouble or interruption.

Project: Set up a multi-user video extension and matrix switching system that operates over a LAN.

The challenge

A major network broadcasting studio in Chicago wanted to set up a video extension and peripheral matrix switching system over its existing Ethernet network. The system needed to enable forty producers, directors, studio technicians, and operators to gain access to more than sixty computers, servers, video sources, and camera feeds from any desk location.

A competitor's system that had been deployed caused daily problems, including delayed switching times, lack of simultaneous access for multiple users, limited device support for USB peripherals, uneven video and audio quality, and unreliable system durability. Additionally, it used an older infrastructure that needed to be updated.

The solution

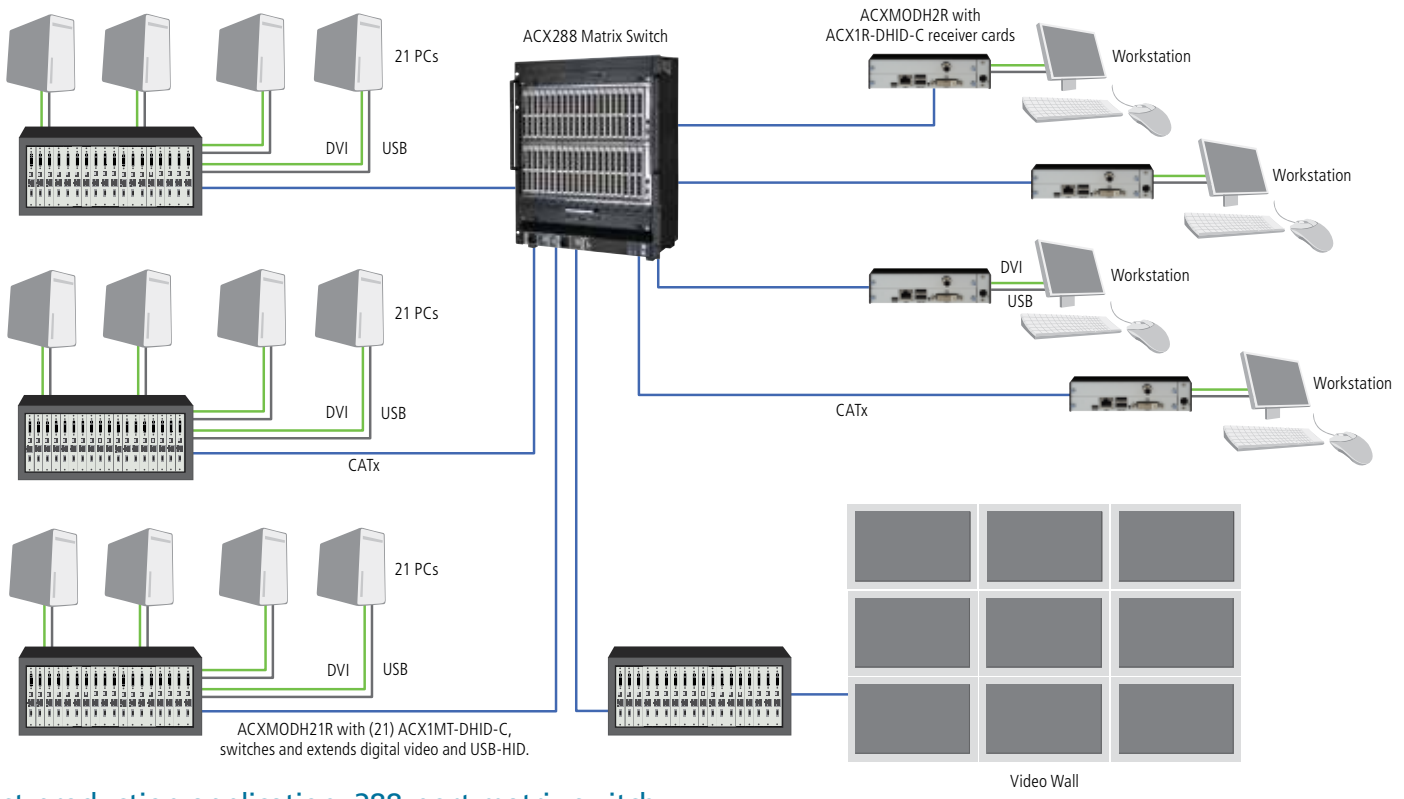
The Chief Hardware Engineer of the studio came to Black Box because he had worked with us on another project for digital signage. He wanted an entire switching and extension solution. The studio is responsible for producing live broadcasts, and the list of issues that needed to be addressed was long. The system needed to be as free of glitches as possible, and extremely reliable and flexible. The current system and its faults left end users frustrated and had IT support dealing with endless trouble tickets. Plus, technical support had to be available 24/7 all the way through the process (pre- and post-sale).

The solution decided upon was the ServSwitch™ Agility Extender platform, which is a system of single-head and dual-head transmitters and receivers that extend DVI, USB, and audio over the local area network (LAN). Since time was of the essence, the Black Box team of product engineers, application engineers, sales specialists, and product managers worked together to review the application

and its challenges. Demo equipment was configured at Black Box and shipped to the studio, where the Chief Hardware Engineer was able to install the setup with minimal online and phone support help from our engineering specialists. Agility transmitters were installed at each server, computer, video source, and camera feed; receivers were connected to each user station. A single point of management and control, the Agility iPATH™ controller, was installed in the server room and deployed over the existing network.

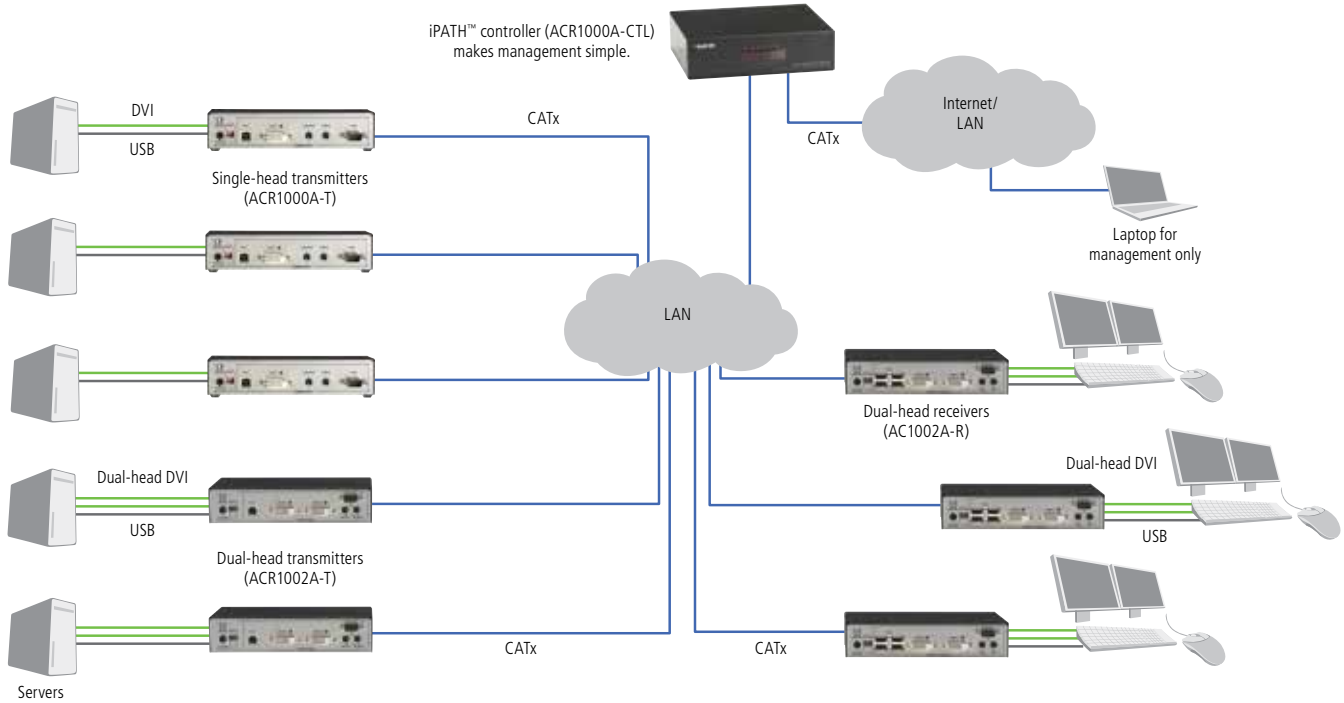
Because this HD video and peripheral matrix switching system is incredibly flexible and scalable, the engineer is able to continue to expand his broadcast configuration, adding equipment and users as required. The Chief Hardware Engineer stays in contact with the engineers from Black Box, and often inquires about feature sets he would like to see on our products. Black Box product development and support teams also continually release updated firmware to fulfill this client's needs.

Application Diagrams



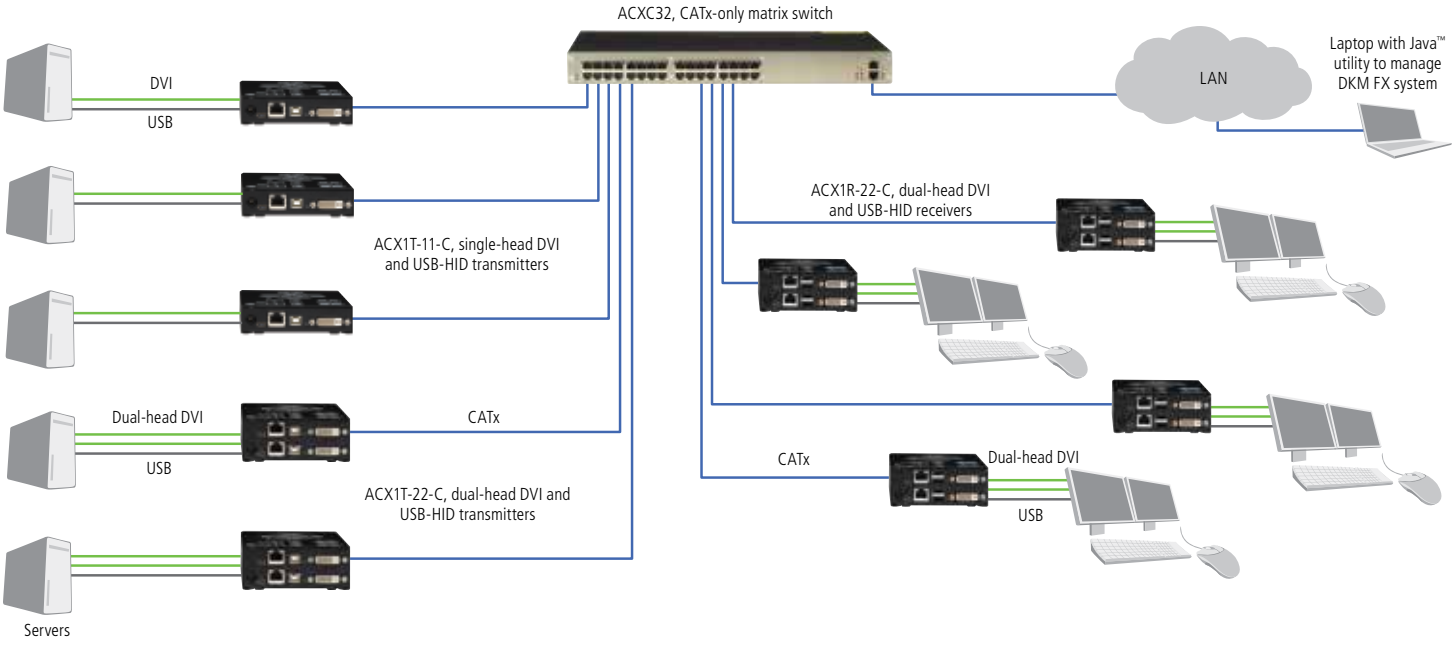
Post-production application, 288-port matrix switch

Designers working from content on different systems can switch servers through the 288-port matrix switch. A system administrator can use the video wall to monitor the rendering process.



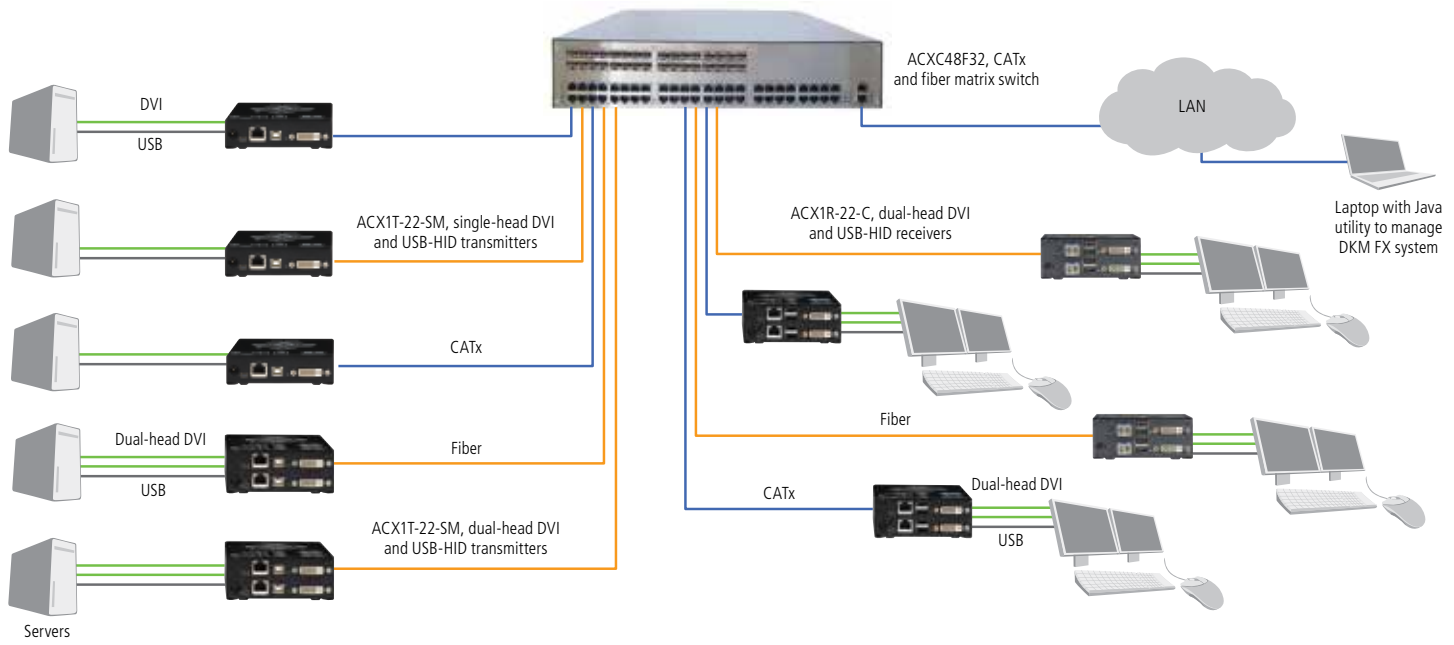
Weather station application, DVI and USB extension over IP

Using the ServSwitch™ Agility Extension system enables remote users, such as meteorologists and weather technicians, to access servers on the network where weather information is stored (local temperatures, radar maps, air pressure) and use it to make their forecasts. The switch and all transmitters and receivers connect into the LAN, providing flexible deployment over existing infrastructure instead of using dedicated CATx runs.



CATx-only extension

Transmit and extend dual-DVI and USB-HID signals over CATx only (above) or a mix of CATx and fiber (below). Both these applications show another way to integrate the DKM FX system into a broadcast or media application. A laptop running the Java™ utility license can manage the system over the LAN, and multiple users can access video and switch stations instantaneously and seamlessly. Workflow in a fast-paced, collaborative environment is supported with this cutting-edge technology.



Mix of fiber and CATx extension

Broadcast and Media Production

Fast switching, multiuser sharing.

Directors, presenters, and editors require an undisturbed work environment. They need fast, flexible, and reliable tools because, as they say in show business, "Time is money."

A. Equipment Room

B. Master Control, Edit Suites, Presenters

C. The System Administrator

In production and post-production environments, collaboration is key. Many people need immediate, real-time access to professional-quality video and sound for review and editing.

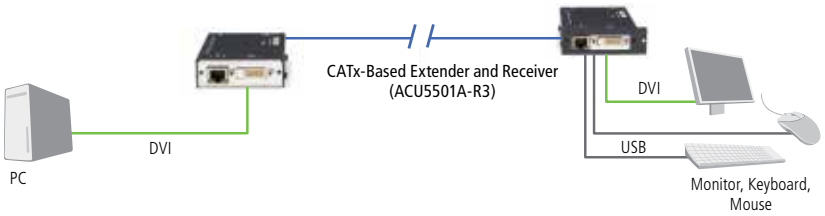
Hybrid KVM and HD video peripheral switching and extension solutions are ideal for broadcasting environments. They enable access by many users at once, in real time, to high-definition video, audio, serial, and USB peripherals. The configuration possibilities are endless. Hybrid KVM and video peripheral switching and extension can run over CATx cable, fiber optic cable, or IP-based networks to reach needed systems.

In the diagram above, KVM and HD video and peripheral extension is used to transmit required signals from the machine room to the end users. **DKM FX extender transmitters (A)** take the signal from a computer and send it over cabling to the **DKM FX extender receivers (B)**. Receivers provide all the necessary ports for connecting devices needed by the users (keyboard, mice, touchscreens, speakers, USB peripherals). **The system administrator can configure, switch, and manage the system from another workstation (C)** with Web-based management software. Individual extension technologies can easily be combined in a freely scalable, high-performance switching matrix.

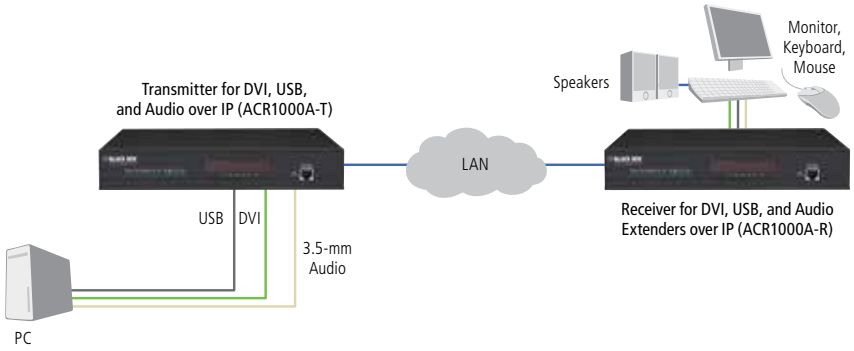
KVM and HD video and peripheral extension optimizes broadcast workflow by using existing network infrastructure. Video signals, including VGA, DVI-I, SDI, and HDMI can be simultaneously transmitted with peripheral signals. The USB interface ensures that even specialty peripherals such as tablets and touchscreens can be easily integrated.

Digital extension technologies

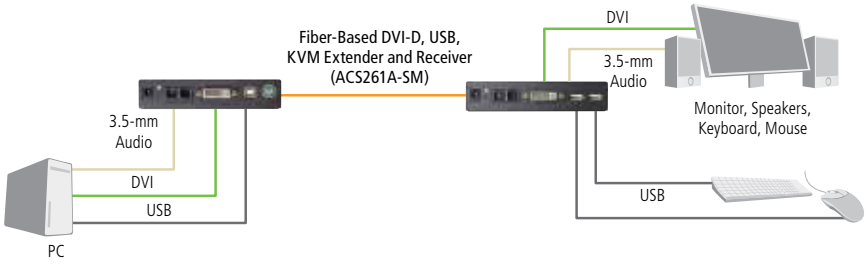
Non-networked CATx extenders use transmitters and receivers to extend converted signals over ordinary (non-networked) UTP cabling. They're very cost-effective and enable much longer distances than what's ordinarily possible with digital video cabling.

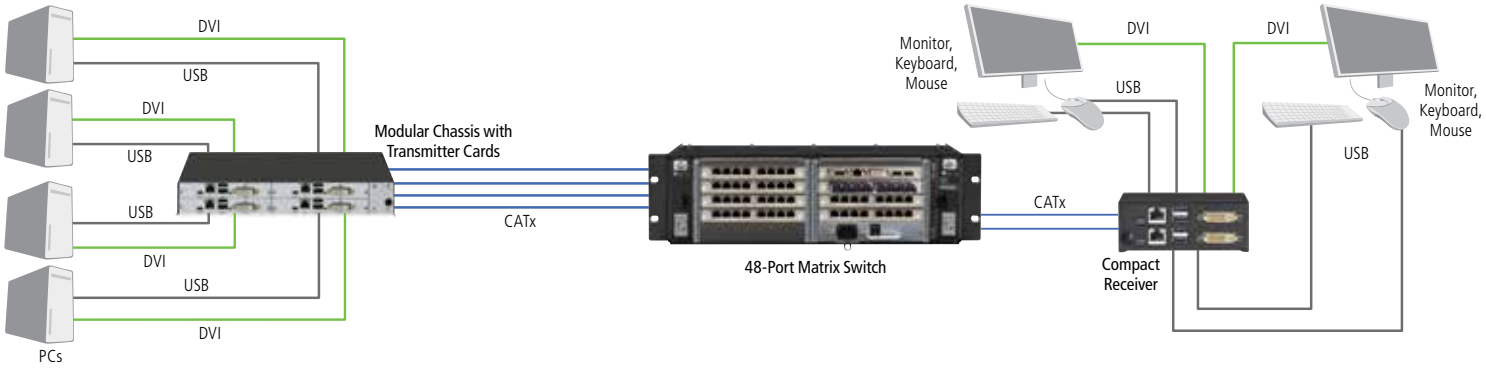


Point-to-point KVM-over-IP extenders use transmitters and receivers to multicast DVI-D video and audio to a distant screen on your network. The transmitter and receiver install directly into your existing LAN infrastructure.



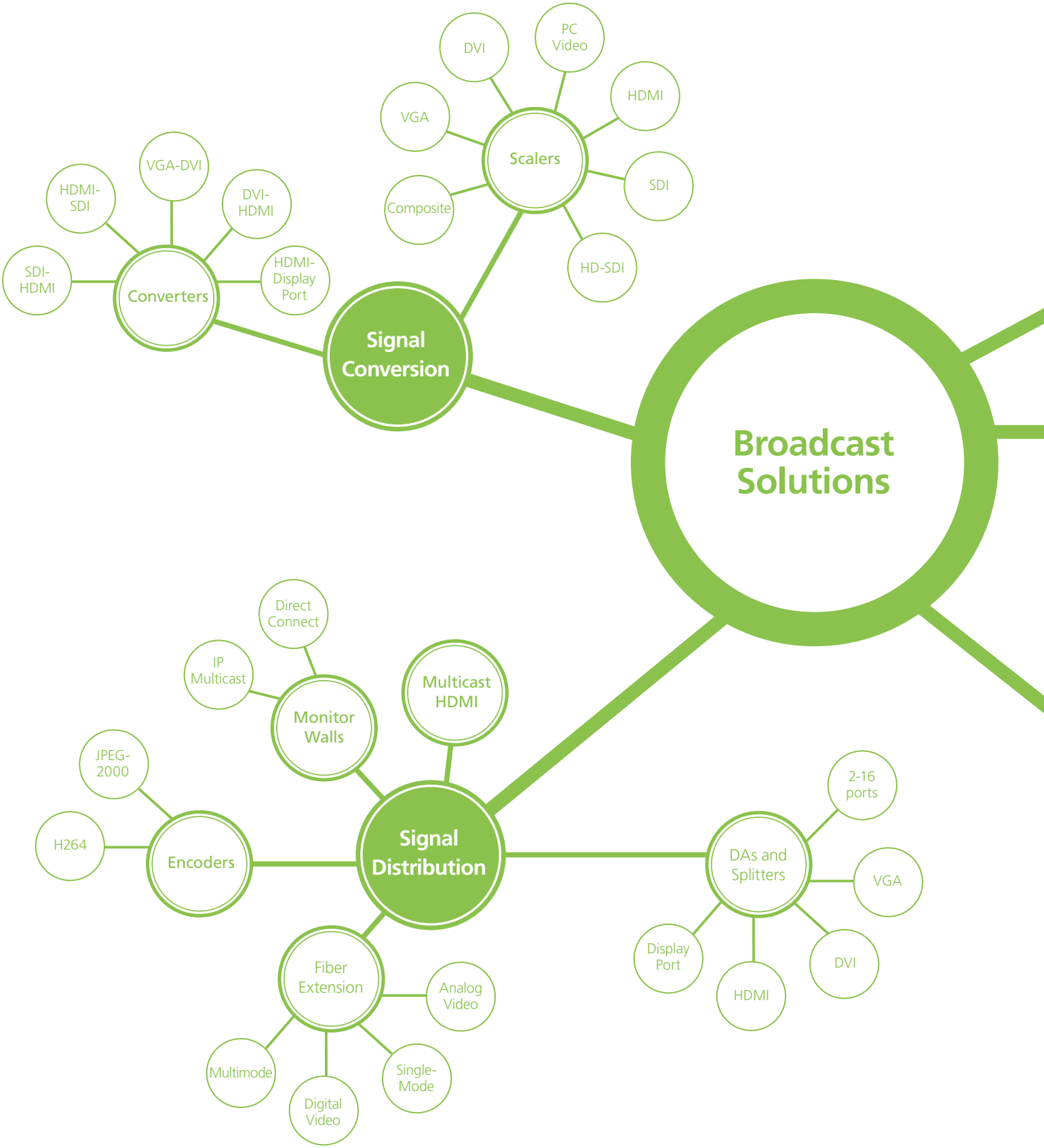
Fiber-based cabling extenders use transmitters and receivers to extend digital signals over secure, interference-free (non-networked) optical fiber. These extenders enable you to deliver video at much longer distances than copper.

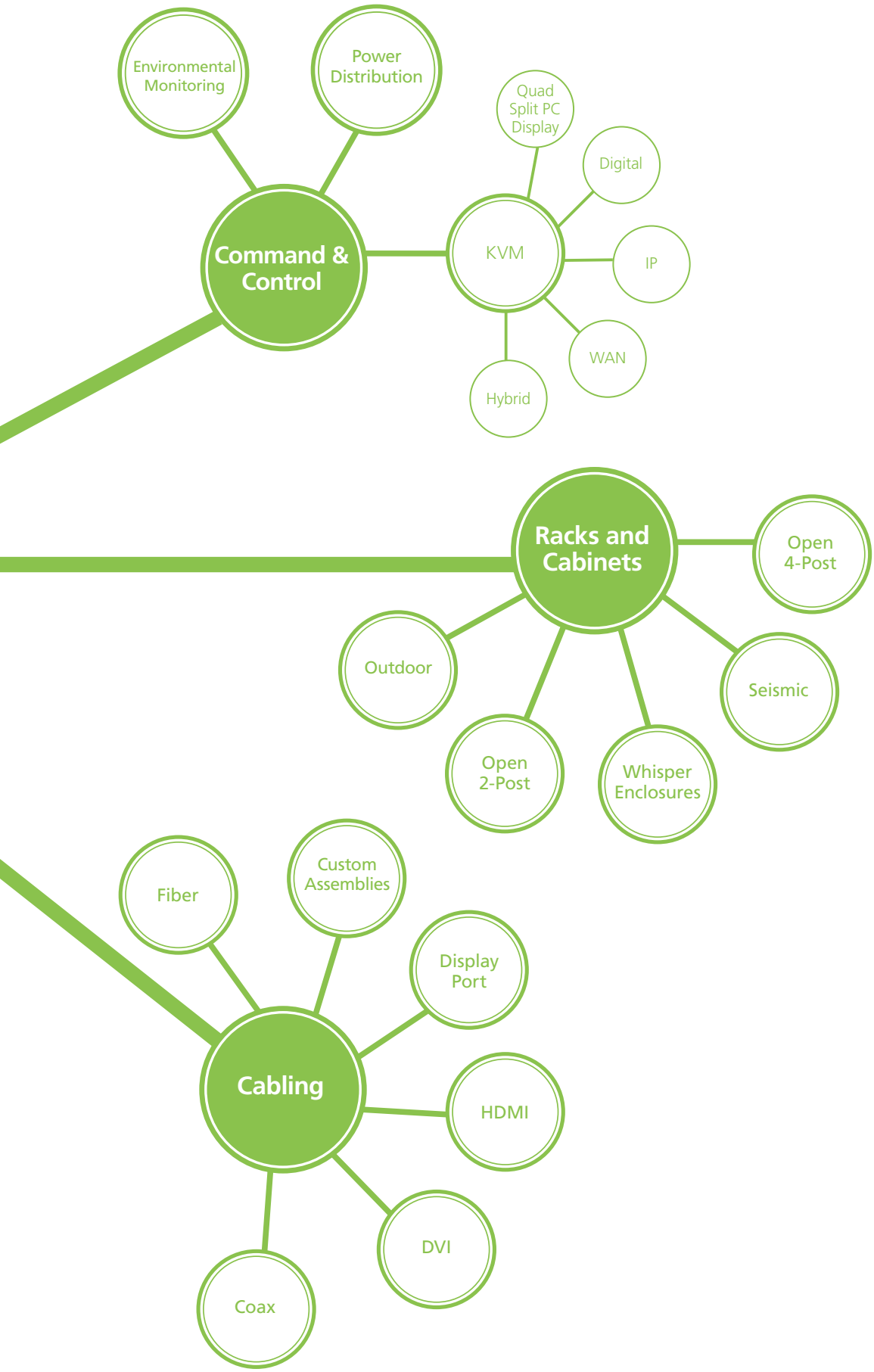




Matrix peripheral switches (also called **crosspoint switches, or routers**) extend video, audio, and USB peripherals to any number of computers and CPUs on your network. You can use a system like this to distribute HD video and USB over copper or fiber, and all ports on the central chassis are input or output.

This kind of chassis-based modular system is flexible, scalable, and highly reliable. It provides instantaneous switching of HD video and peripherals. Ideal for broadcasting, healthcare, government, and other applications where multiple users need to collaborate and view a variety of media.


Broadcast Solutions
Signal Conversion
Scalers
DVI
PC Video
HDMI
VGA
SDI
Composite
HD-SDI
Converters
VGA-DVI
HDMI-SDI
DVI-HDMI
SDI-HDMI
HDMI-Display Port
Signal Distribution
Monitor Walls
Direct Connect
IP Multicast
Multicast HDMI
Encoders
JPEG-2000
H264
DAs and Splitters
2-16 ports
VGA
Display Port
HDMI
DVI
Fiber Extension
Analog Video
Multimode
Digital Video
Single-Mode


Environmental Monitoring
Power Distribution
Quad Split PC Display
Digital
IP
WAN
Hybrid
KVM
Command & Control
Racks and Cabinets
Open 4-Post
Outdoor
Seismic
Open 2-Post
Whisper Enclosures
Fiber
Custom Assemblies
Display Port
HDMI
DVI
Coax
Cabling

Leading-edge technologies that deliver unparalleled performance.

DKM FX and FX Compact HD Video and Peripheral Matrix Switching Platform

Black Box is pleased to provide a hybrid matrix switching solution for multiple signal types in an innovative product system, the DKM FX and FXC HD Video and Peripheral Matrix Switching system. The DKM FX platform replaces multiple devices with one hybrid solution by supporting routing, switching, and multi-point distribution of **HD-SDI**, **HDMI**, and **DVI**, as well as state-of-the-art KVM functionality. This game-changing product replaces up to four single-purpose devices with one robust solution, thereby saving customers time, money, complexity, and potential integration hassles.

Flexible hybrid switching of Full-HD video for broadcast, post-production, and command and control rooms.

DKM FX Matrix Switches

80-port DKM FX Switch (ACX080)

- A scalable, highly reliable video and peripheral matrix switching and routing system supporting high-resolution HD-SDI, HDMI, and KVM in one flexible, scalable product.
- Supports high-quality, full frame digital video. Digital resolutions up to 2560 x 1600.
- Modular platform with up to 288 bidirectional ports makes moves, adds, and changes quick and easy.
- Choose from CATx and single-mode fiber SFP modular card interfaces. Single-mode fiber interface cards also work over multimode fiber.
- Enables mixing of media on inputs and outputs—CATx in and fiber out, or vice versa.
- Included control card supports management via KVM, network, or serial console. N+ 1 power supplies supported.
- Switches in less than one frame. Hot-key switching enables user to bypass the standard on-screen display for truly instant access to critical systems.
- **Learn more at www.blackbox.com/go/DKM-FX.**

Instantaneous switching of HD video in a smaller, more compact model for fewer users.

DKM FX Compact Matrix Switches

48-port DKM FXC Switch (ACXC48)

- Use the cost-effective DKM FX Compact switches to establish connections from consoles (monitor, keyboard, mouse, and other peripheral devices) to various sources, such as computers and CPUs.
- RJ-45 CATx ports can be input or output.
- Series supports from 8 to 48 ports in a 1U chassis for easy mounting in server cabinets.
- Use with DKM FX Modular and Compact extenders (ACX1MT/R series and ACX1T/R series) to extend video, KVM, and USB 2.0 signals.
- Uses CATx cabling for extension, and some models have up to 16 SFP slots for fiber connectivity.
- Redundant power supplies included.
- **Learn more at www.blackbox.com/go/DKM-FX.**

Get perfect digital video with no loss, and extend DVI, USB, and audio over your LAN.

ServSwitch™ Agility

- Pure digital media extension and matrix switching over IP.
- No-loss compression minimizes bandwidth use while maximizing the user experience.
- Configure your network to suit your needs: point-to-point extension, KVM switching, single-target sharing, or multicasting.
- Features keyboard/mouse emulation and emulation for other standard human interface devices (HIDs), such as touchscreens or flash drives.
- **Learn more at blackbox.com/go/ServSwitchAgility.**

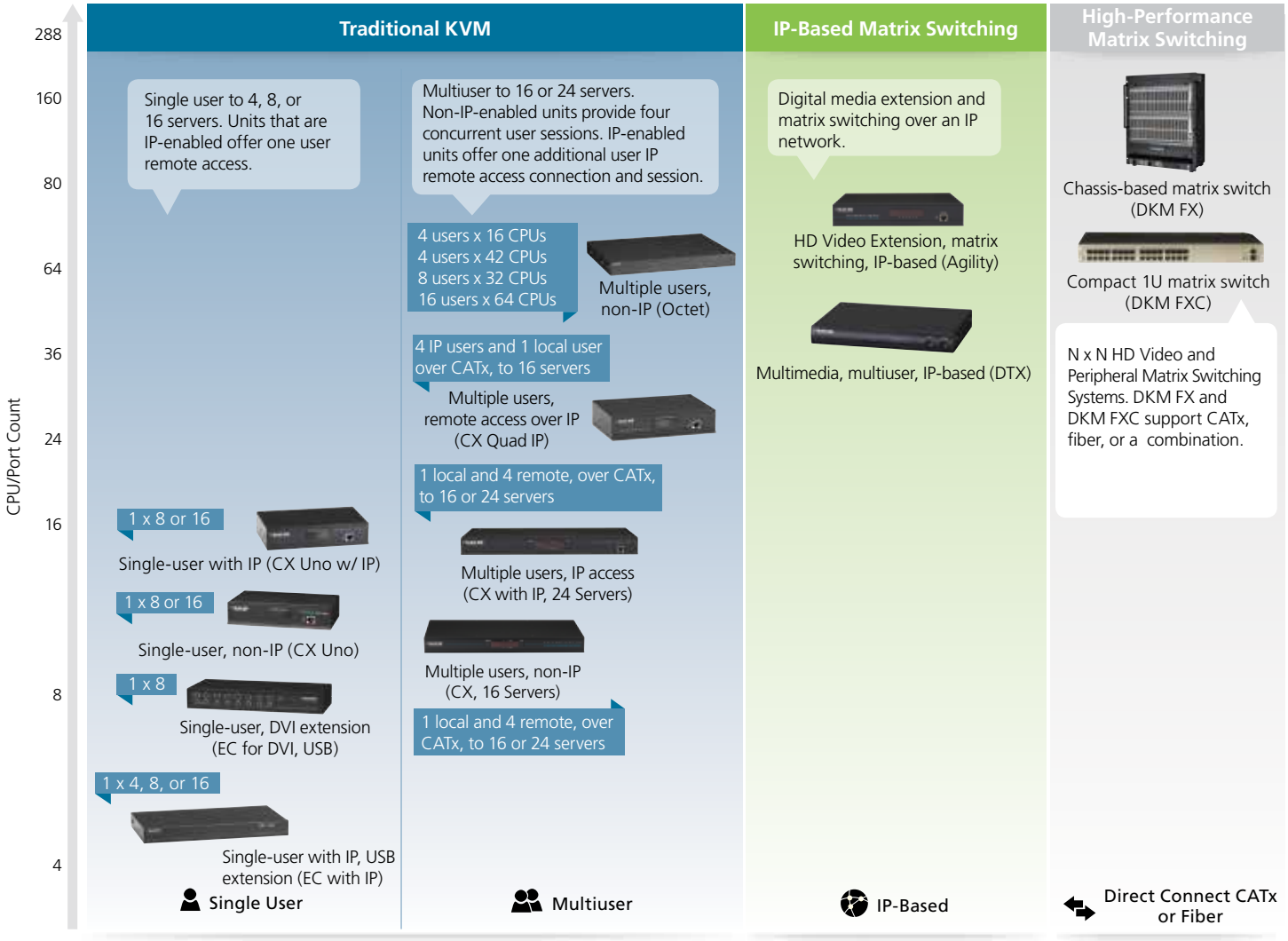
ACR1000A

Fluid video performance in a quad-screen viewer with KVM and video processors for monitoring and control.

ServSwitch 4Site Flex

- Keep track of multiple screens without banks of monitors.
- 4-to-1 KVM switching with smooth, real-time image processing: DVI, VGA, HDMI, HDCP support.
- Ensures short reaction times in mission-critical applications.
- **Learn more at blackbox.com/go/4Site.**

KVP4004A



Professional AV: From our experts to your experts.

Extend, scale, and switch with ProAV equipment.

Black Box's family of audio visual products, which include extenders, scalers, and converters, makes your job even easier by extending, converting, and scaling video and audio signals.

Scale analog and digital video inputs, including DisplayPort, for either HDMI or VGA output.

Multiformat AV Scaler

- Professional, multiformat/multiport scaler features seven different inputs.
- Outputs VGA and HDMI 1080p with 36-bit deep color video plus SPDIF and stereo audio.
- HDCP compliant and Blu-ray™ ready.
- Ideal from front panel, IR remote control, via a Windows GUI via RS-232 port, or from an Ethernet connection.
- **Learn more at www.blackbox.com.**

AVSC-7DA-HDMI

Extend HDMI video over a LAN to an unlimited number of distant screens—or to video walls.

MediaCento™ IPX PoE

- Use your existing local area network (LAN) to transmit HDMI and audio to remote screens, including video wall setups.
- Can be remotely powered over the Ethernet using standard 802.3af PoE.
- This IP-streaming solution can be multicast or point-to-point distribution.
- Transmitters and receivers install directly into your existing LAN infrastructure, so integration is simple.
- **Learn more at www.blackbox.com/go/MIPX.**

VX-HDMI-IP-VRX

Output HDMI, audio, and HDBaseT signals with this high-performance matrix switch.

8 x 8 HDMI Matrix Switch with Extension

- Compatible with all HDMI source devices, PC monitors, plasma HD displays, HDTV, and audio receivers and amplifiers.
- Eight (8) inputs and eight (8) outputs for matrix switching of HDMI and HDBaseT extension.
- Supports HDMI video with embedded audio, DVI digital video, and complies with CEC/HDCP 2.0.
- Supports automatic intelligent EDID handling for compatibility with any display.
- **Learn more at www.blackbox.com.**

AVSW-HDMI8X8-X

Sturdy, dependable construction for mission-critical equipment.

Specialty Enclosures and Enviromental Monitoring

Black Box offers a complete line of IT enclosures for storing and securing equipment in diverse environments, including those in earthquake zones and areas where equipment needs to be near workers. The AlertWerks™ Environmental Monitoring System guards against water, temperature extremes, fire, and more.

Put key systems where you need them—without the noise.

QuietCab™ and Elite QuietCab

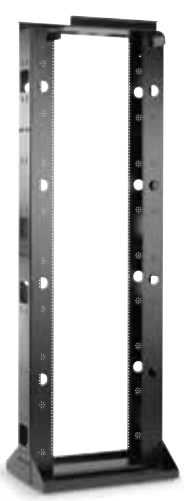
- Whisper-quiet and secure, these are perfect in a production environment, edit suite, or mixing room.
- Acoustic foam lining reduces audible server and hardware noise by 15 dB to over 28 dB to normal background levels.
- Integrated ventilation fans provide up to 3.6 kW thermal capacity in QuietCabs and up to 7.2 kW in Elite QuietCabs.
- Furniture-grade finishes are available in beech, light gray, and walnut laminate. Cabinets are 12U, 24U, and 42U.
- **Learn more at www.blackbox.com/go/QuietCab.**

QC24UWA

Server cabinets and racks designed for locations that require seismic ratings.

Zone 4 Seismic Cabinets and Racks

- Cabinets' performance rating is based on NEBS-Telcordia GR-63-CORE standard vibration test.
- Vented heavy-gauge steel base can be bolted to the floor with seismic-rated fasteners.
- Choose from 40" and 32" deep cabinets; and 2- and 4-post racks.
- Racks meet California Building Code requirements.
- **Learn more at www.blackbox.com/go/Zone4.**



RM5100A

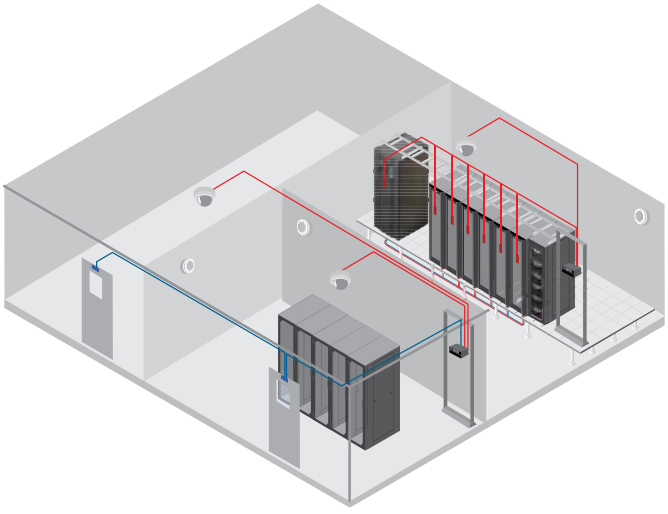
RM5200A

Guard mission-critical IT equipment against physical threats.

AlertWerks™ Environmental Monitoring System

- Complete environmental monitoring over any IP network—including the Internet.
- Monitor water, humidity, airflow, temperature extremes, motion, smoke and fire, AC voltage, theft and tampering, and more.
- System consists of AlertWerks ServSensor Hubs and AlertWerks Intelligent Sensors.

more info AlertWerks Sensors, Video, Brochure, Expansion Modules, Cameras: blackbox.com/go/AlertWerks



ProAV and KVM Sourcing Guides

Applications | Products | Education

What you need to design end-to-end AV and signage systems:

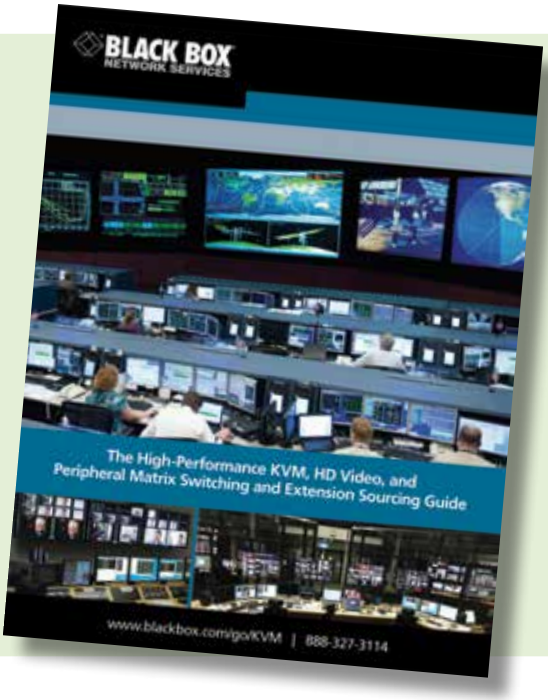
» HD video distribution and AV-over-IP or CATx

» Networked digital signage

» Video scaling, conversion, and switching

» Wireless presentation solution

To get the guide, visit
blackbox.com/go/GuideDS
or call 800-355-8003.



Plan and deploy fully integrated HD video, KVM, and matrix switching systems:

» High-performance KVM

» HD video and peripheral matrix switching

» KVM, HD video, and peripheral extension

» KVM and HD video extension over IP networks

To get the guide, visit
blackbox.com/go/KVMGuide
or call 888-327-3114.

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